

AMSAT News Service Weekly Bulletins

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AMSAT NEWS SERVICE

ANS-076

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on <http://www.amsat.org> publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

You can sign up for free e-mail delivery of the AMSAT News Service Bulletins via the ANS List; to join this list see:
<http://www.amsat.org/mailman/listinfo/ans>

In this edition:

- * AMSAT at the Dayton Hamvention -- Call for volunteers
- * Out of This World Auction Sponsored by ARISS
- * 50th Anniversary AMSAT OSCAR Satellite Communications Achievement Award
- * Lilacsat-1 L0-90 Re-entry Commemorative Competition
- * ARRL TI-2 Teachers Institute Includes Amateur Satellite Telemetry
- * ARRL Supports No Change to Table of Allocations for 45.5 - 47 and 47 - 47.2 GHz Bands
- * Upcoming Satellite Operations
- * AMSAT-DL Q0-100 Up- and Downconverter Kit Modifications Announcement
- * Changes to the AMSAT-NA TLE Distribution This Week
- * Satellite/AMSAT Presentation at Phoenix AZ - March 21, 2019
- * VUCC Awards-Endorsements for February 2019
- * GPS Network May Experience Errors in "Week Number" Rollover
- * Satellite Shorts From All Over

SB SAT @ AMSAT \$ANS-076.01

ANS-076 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 076.01

From AMSAT HQ KENSINGTON, MD.

DATE March 17, 2019

To All RADIO AMATEURS

BID: \$ANS-076.01

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AMSAT relies on your donations to Keep Amateur Radio in Space
Please consider a one-time or recurring donation today at
<https://www.amsat.org/donate/>
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AMSAT at the Dayton Hamvention -- Call for volunteers

Last year, we had about 40 people assist with the AMSAT booth at the Hamvention. It was the efforts of those volunteers that made

the 2018 Dayton Hamvention a success for AMSAT.

The interaction with AMSAT members, satellite operators, designers, and builders makes the whole experience a lot of fun.

The 2019 Hamvention is May 17-19 at the Greene County Fairgrounds in Xenia, Ohio. Would you consider helping AMSAT at the Hamvention this year? Whether you're available for only a couple of hours or if you can spend the entire weekend with us, your help would be greatly appreciated.

Please send an e-mail to Phil, [wleme\(a\)amsat.org](mailto:wleme(a)amsat.org) if you can help.

[ANS Thanks WLEME for the above information]

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AMSAT and ARISS are currently supporting a FundRazr campaign to raise \$150,000 for critical radio infrastructure upgrades on ISS. The upgrades are necessary to enable students to continue to talk to astronauts in space via Amateur Radio, ensure reliable packet operations and to keep the immensely popular SSTV operations running.

We have reached a great milestone with \$17,255 raised or about 12% towards our goal. This would not have been possible without your outstanding generosity!!

ARISS has a lot of exciting upgrades to the ISS Radio system coming up. And we are in the expensive fabrication and testing phase right now. So every dollar counts!!

For more information and to DONATE TODAY visit:

https://fundrazr.com/arissnextgen?ref=ab_e7Htwa_ab_47IcJ9

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Out of This World Auction Sponsored by ARISS

March 6, 2019 – The ARISS-US team (Amateur Radio on the International Space Station) will auction two very unusual items in its first-ever auction! Picture yourself as the winning bidder and proud owner of a unique JVC Kenwood TS-890S signed by astronauts! Or, you could be top bidder on a special astronaut-signed 6-volume boxed set 2019 ARRL Handbook!

Bidding starts April 8th at 12:00 UTC and ends April 14th at 22:00 UTC.

You could own this one-of-a-kind beautiful Kenwood TS-890S; your ham station would boast the only Kenwood in the world showcasing astronaut signatures. Your top bid on the limited edition boxed-set 2019 ARRL Handbook for Radio Communications would mean your bookshelf includes astronaut signatures among your book collection.

JVC Kenwood, a proud supporter of ARISS, generously gave a brand new TS-890S for ARISS to auction. They first offered the radio for sale in the US in the last half of 2018. Kenwood has been a super supporter of ARISS for years, and it was the company's idea for this radio, with astronaut signatures, to be an exclusive that just one ham operator could own! The company hopes you'll be a bidder who wants to support ARISS.

The limited edition 2019 ARRL Handbook for Radio Communications sold out fast once ARRL posted their ad. It was the first time that ARRL

divided the Handbook into volumes, which nestle in a hard slipcase. ARRL, an ARISS sponsor along with AMSAT and NASA, saved back one boxed set to give ARISS for the fund-raiser auction.

When you bid in this auction you could be the crucial person who helps ARISS launch its new custom-built higher-power radio system in 2019 with its voice repeater and improved packet APRS and SSTV capability that thousands of hams enjoy. The new system will replace the aging, problematic units currently on the ISS. You may be the winning bidder who helps ARISS continue introducing ham radio to thousands of students, teachers, parents, and whole communities—and inspiring students about science, technology, engineering, math, and radio!

Don't forget; set yourself a reminder: bidding starts April 8th at 12:00 UTC and ends April 14th at 22:00 UTC.

Be the winning bidder for one or both of these two exclusive offerings and you'll own a rare article that makes your ham station a classic! More auction details will soon be posted at www.ariss.org including that winning bidders will be responsible for shipping costs and for handling any required customs paperwork. ARISS thanked JVC Kenwood and ARRL for their generous support.

And if you don't do auctions, please contribute a donation to help ARISS launch its new radio system into space—look for the Donate button near the top right corner of the www.ariss.org page. Thank you!

About ARISS

Amateur Radio on the International Space Station (ARISS) is a cooperative venture of international amateur radio societies and the space agencies that support the International Space Station (ISS). In the United States, sponsors are the Radio Amateur Satellite Corporation (AMSAT), the American Radio Relay League (ARRL), the Center for the Advancement of Science in Space (CASIS) and National Aeronautics and Space Administration (NASA). The primary goal of ARISS is to promote exploration of science, technology, engineering, and mathematics (STEM) topics by organizing scheduled contacts via amateur radio between crew members aboard the ISS and students in classrooms or public forms. Before and during these radio contacts, students, educators, parents, and communities learn about space, space technologies, and amateur radio. For more information, see www.ariss.org.

Media Contact:
Dave Jordan, AA4KN
ARISS PR
[aa4kn at amsat.org](mailto:aa4kn@amsat.org)

[ANS thanks ARISS for the above information]

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2019 marks AMSAT's 50th Anniversary
of Keeping Amateur Radio in Space.
To help celebrate, we are sponsoring the
AMSAT 50th Anniversary Awards Program.
Full details are available at

<https://www.amsat.org/amsat-50th-anniversary-awards-program/>

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50th Anniversary AMSAT OSCAR Satellite Communications Achievement Award

Bruce Paige, KK5D0, AMSAT Director Contests and Awards says the 50th Anniversary AMSAT OSCAR Satellite Communications Achievement Award is now online:

<https://www.amsat.org/amsat-50th-anniversary-awards-program/>

Unlike the AMSAT Satellite Communications Achievement Award, the 50th Anniversary AMSAT Satellite Communications Achievement Award will be issued on one of the original goldenrod paper stock certificates and signed by AMSAT's founding President, Perry Klein, K3JTE (now W3PK). With only 20 original certificates available, this award will certainly become a collector's item.

The first 20 applicants to successfully submit 20 confirmed, qualifying contacts on any satellite will receive this award.

A qualifying contact is defined as the establishment of two-way communication on any amateur radio satellite, with another station in a U.S. state, Canadian call area, or DXCC entity, no two of which may be the same. A U.S. state shall mean any state of the United States and the District of Columbia.

All contacts must be made between March 03, 2019 00:00 UTC and December 31, 2019 23:59 UTC. Refer to the 50th Anniversary Awards program page (above) for the complete set of requirements and submission instructions.

As of March 15 Bruce says he issued 50th Anniversary Satellite Communication Achievement Awards to these satellite operators:

Award # Callsign

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590	W5RKN
591	K7TAB
592	KG5GJT
593	KB6LTY
594	KC9VGG
595	K6FW
596	N1RCN
597	K5IX
598	WD9EWK
599	KI7UNJ
601	VA3NNA

(Award #600 was not a 50th certificate and went to W5RTX.) There are 9 more 50th Anniversary Anniversary Satellite Communication Achievement Awards still available.

[ANS thanks Bruce Paige, KK5DO, AMSAT Director Contests and Awards for the above information]

Lilacsat-1 L0-90 Re-entry Commemorative Competition

Wei Mingchuan, BG2BHC, at the Harbin Institute of Technology in China says L0-90 (Lilacsat-1) is about to re-enter so the L0-90 team has announced the Lilacsat-1 Commemorative Competition (LOCC). Use Google translate to learn more of Lilacsat-1 at:
<http://lilacsat.hit.edu.cn/wp/>

The contest period begins on March 16, 2019 at 00:00 UTC and continues until Lilacsat-1 re-enters. The competition consists of two operating categories:

- + Amateur Radio Telemetry Group
 - Receive and upload as many telemetry packets as possible within the competition period.
- + Amateur Radio Communication Group

- Make as many bidirectional QSO as possible in as many grid locator as possible within the competition period.

For the telemetry competition each successfully uploaded telemetry packet to the Harbin Institute of Technology server counts as one point. BG2BHC advises there is a change to the Lilacsat-1 telemetry upload proxy address. Those using <http://lilacsat.hit.edu.cn> should change it to <http://data.lilacsat.online> in proxy window of the dashboard.

For the amateur radio communication competition a bidirectional contact consists on exchange of callsign and grid locator. Each QSO will count as one point. Each different grid counts as one multiplier. Duplicate QSOs with the same callsign do not count.

Scoring and Awards

In the Amateur Radio Telemetry Group: final score = basic point which is the total number of telemetry packets uploaded. All telemetry data uploaded qualifies for a LilacSat-1 QSL card.

In the Amateur Radio Communication Group:
final score = basic point * multiplier

- + China: top 3 certificates issued.
- + World: Top 10 certificates issued.
- + The ham who receives the last downlink signal in the world and successfully uploads it to the server will receive a special gift.
- + Honor stickers - portable stations set up and operated in the field for this contest will receive a "Fiel " sticker affixed to the certificate. (Include a photo of the portable station.)

The L0-90 team will publish the telemetry package list received from March 16, 2019 00:00 UTC to LilacSat-1 re-entry. Telemetry participants should send an e-mail with your callsign and address to: [locc\(a\)lilacsat.online](mailto:locc(a)lilacsat.online). (no later than April 30, 2019 00:00 UTC)

Communication category participants should submit logs in Cabrillo or Excel XLS format containing your e-mail address, sent/received exchange information, UTC time of QSO. Send logs and information to [locc\(a\)lilacsat.online](mailto:locc(a)lilacsat.online) no later than April 30, 2019 00:00 UTC. Include your photo of portable operation if applicable.

L0-90 (LilacSat-1) operates on an FM uplink with a Codec2 digital voice downlink. A Linux Live ISO image with the decoder can be downloaded from: <http://tinyurl.com/ANS-074-L090-LiveCD> (This will also work on Windows systems by booting off of the Linux Live CD. Then you reboot back into Windows when the pass is completed.)

L0-90 Lilacsat-1 (http://lilacsat.hit.edu.cn/wp/?page_id=594)

Uplink: 145.985 MHz FM

Downlink: 436.510 MHz Codec2 digital voice

Paul Stoetzer, N8HM, has documented his L0-90 operating setup in his article, "Digital Voice on Amateur Satellites: Experiences With Lilacsat-OSCAR 90", published in the January/February 2019 issue of the AMSAT Journal. A PDF copy of this article can also be accessed on AMSAT's Station and Operating Hints page: to <https://www.amsat.org/station-and-operating-hints/>

AMSAT-UK has posted an article about Lilacsat-1 at:

<https://amsat-uk.org/satellites/communications/lilacsat-1/>

Orbital evolution estimates for Lilacsat-1 posted on DK3WN's page indicate re-entry around March 31: <http://www.dk3wn.info/p/?p=93929>

[ANS thanks the L0-90 team and the Harbin Institute of Technology for the above information]

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Purchase AMSAT Gear on our Zazzle storefront.
25% of the purchase price of each product goes
towards Keeping Amateur Radio in Space
https://www.zazzle.com/amsat_gear
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ARRL TI-2 Teachers Institute Includes Amateur Satellite Telemetry

The ARRL announced 2019 Teachers Institutes on Wireless Technology sessions. As part of its educational outreach through the Education & Technology Program (ETP), ARRL will offer week-long sessions of the Teachers Institute on Wireless Technology in July at ARRL Headquarters in Newington, Connecticut.

Applicants to the advanced TI-2 "Remote Sensing and Data Gathering" workshop are required to have completed TI-1 and be licensed Amateur Radio operators. Interested educators can find all the details and apply online at: <http://tinyurl.com/ANS-076-ARRL-TI2>

The TI-2 "Remote Sensing and Data Gathering" workshop will concentrate on analog-to-digital conversion and data sampling. Participants will receive telemetry from Amateur Radio satellites and apply it to math and science topics. TI-2 participants are also introduced to a marine research buoy equipped with environmental sensors and taught how to create a similar design with a microcontroller to sample the data, configure it for Automatic Packet Reporting System (APRS) transmission, and receive and upload data to a spreadsheet for analysis.

For more information, contact ARRL Lifelong Learning Manager Kris Bickell, K1BIC, at ARRL Headquarters.

[ANS thanks the ARRL for the above information]

ARRL Supports No Change to Table of Allocations for 45.5 - 47 and 47 - 47.2 GHz Bands

The FCC has opened a brief window for public comment on recommendations approved by the World Radiocommunication Conference Advisory Committee (WAC). Comments are due March 18 on International Bureau Docket 16-185. The FCC said the short comment period was necessary to allow time to finalize the US position for submission to the upcoming meeting of the Inter-American Telecommunication Commission (CITEL).

The Public Notice can be found in PDF format at, <https://docs.fcc.gov/public/attachments/DA-19-172A1.pdf>.

Addressing WRC-19 Agenda Item 1.13, which serves to identify spectrum above 24.25 GHz that may be designated for International Mobile Telecommunications (IMT), ARRL has recommended no change in the 45.5 - 47 and 47 - 47.2 GHz bands, with hopes that commenters will agree. The 47 - 47.2 GHz band is allocated to the Amateur and Amateur Satellite services.

ARRL and other no-change proponents point out that no sharing and compatibility studies were performed between IMT-2020 systems and the relevant incumbent services in the 45.5 - 47 GHz and 47 - 47.2 GHz bands, although sharing and compatibility studies for a number of incumbent services were required under Resolution 238 of World Radiocommunication Conference 2015 (WRC-15).

"In the absence of ITU Radiocommunication Sector studies, the only sustainable conclusion is that it has not been demonstrated that the incumbent services in either band - the Mobile-Satellite Service, the Radionavigation Service, and the Radionavigation-Satellite Service in the 45.5 - 47 GHz band, and the Amateur and Amateur-Satellite services in the 47 - 47.2 GHz band - can be protected, as required by Resolution 238," asserts the proponents of View B, which sides with no change to the current allocations.

"In this regard, the View A proposal to identify mobile spectrum in the 45.5 - 47 GHz band for the terrestrial component of IMT, and to allocate spectrum in the 47 - 47.2 GHz band to the mobile service and identify the same for the terrestrial component of IMT, is fatally flawed. The absence of studies in the responsible ITU-R task group leaves the proposals unsubstantiated and incapable of adoption."

View B proponents, including ARRL, are urging the FCC to accept the proposals of the National Telecommunications Information Administration (NTIA) for no change to the Table of Allocations in the 45.5 - 47 GHz and 47 - 47.2 GHz bands.

[ANS thanks the ARRL for the above information]

Upcoming Satellite Operations

- + Eureka Nunavut (ER60, EQ79) – February 3, to March 29, 2019
Eureka ARC, VY0ERC, will be QRV from Eureka, NU (NA-008). Time and weather permitting, they expect to be on the FM satellites from ER60 and EQ79. Announcements will be posted on Twitter at: <https://twitter.com/vy0erc>.
- + Radio Club de Heredia (EK70/EJ79) – March 17, 2019
Vic (TI2VLM), Octavio (TI3ATS), and Minor (TI2Y0) will activate the EK70,EJ79 gridline at the Radio Club de Heredia, TI0RHU 30th Anniversary Field Day. Planned satellite passes are: A0-92 @ 13:27z, S0-50 at 16:37z, and A0-91 @ 17:47z. Watch for further announcements on Twitter: <https://twitter.com/ti2vln> and <https://twitter.com/OctavioAraya>.
- + Key West, FL (EL94) – March 18-21, 2019
Adam, K0FFY, will be in Florida Keys on March 18 through 21, activating EL94 vacation-style. Adam's taking his linear gear to see who he can hear East and South of that location. If you still need EL94 please send direct message or email. Otherwise, he'll be announcing on Twitter https://twitter.com/K0FFY_Radio
- + Ontario (EN93,EN94,FN03, FN04) – March 18-21, 2019
Ron, AD0DX, with his tire still warm from his last roving trip, is heading to Ontario, March 28th for a one day, four grid, special. Ron will tweet passes the day of the rove, which will most likely be morning passes. Follow Ron on his journey at <https://twitter.com/ad0dx>

Please submit any additions or corrections to ke4al (at) amsat.org

[ANS thanks Robert, KE4AL for the above information]

AMSAT-DL QO-100 Up- and Downconverter Kit Modifications Announcement

AMSAT-DL has recommended a modification to their QO-100 Upconverter and Downconverter kits which were shipped prior to March 1 to improve performance of the uplink SSB transmit signal and address reduced gain of the downlink wide-band DATV reception. Refer to AMSAT-DL's post at: <http://tinyurl.com/ANS-076-AMSAT-DL-Converter>

Kits being shipped currently will already have the modification. The changes primarily affect the wide-band DATV signal so the users of the narrow-band CW/SSB only operations are less affected.

Users able to perform the modification themselves will find the instructions posted at:
<https://amsat-dl.org/en/fix-fuer-qo-100-downconverter>

For users unable to make the modification themselves AMSAT-DL says instructions for exchange of the old kits will be published soon.

[ANS thanks AMSAT-DL for the above information]

Changes to the AMSAT-NA TLE Distribution This Week

Ray Hoad, WA5QGD, AMSAT Orbital Elements Manager, noted changes to the AMSAT-NA TLE distribution this week.

Exseed, Irvine 2 and VisionCube cubesats are not transmitting. They are part of the SpaceX SS0-A 12-03-2019 mission. Since they are not transmitting, the remaining objects listed by Space-Track are either one of these three non-transmitting amateur satellites or they are non-amateur satellites. Therefore, the remaining unidentified satellites on the SpaceX AA0-A mission can be removed from the AMSAT-NA TLE distribution.

The following satellites have been removed from this week's AMSAT TLE distribution:

OBJECT D - CAT ID 43761
OBJECT P - CAT ID 43771
OBJECT T - CAT ID 43775
OBJECT U - CAT ID 43776
OBJECT W - CAT ID 43778
OBJECT X - CAT ID 43779
OBJECT AH - CAT ID 43789
OBJECT AV - CAT ID 43801
OBJECT BA - CAT ID 43806
OBJECT BD - CAT ID 43809
OBJECT BE - CAT ID 43810
OBJECT BS - CAT ID 43822

[ANS thanks Ray Hoad, WA5QGD, AMSAT Orbital Elements Manager for the above information]

Satellite/AMSAT Presentation at Phoenix AZ - March 21, 2019

Patrick, WD9EWK, will give a how-to presentation on working amateur satellites and AMSAT at the Thunderbird Amateur Radio Club's monthly meeting on Thursday, March 21, 2019.

The meeting site is room 147 at the North Valley campus of Northern Arizona University, 15451 N. 28th Drive in Phoenix AZ (northwest corner of I-17 and Greenway Road).

More information is available at:
<http://www.w7tbc.org/content.php?128-general>

Patrick plans to demonstrate satellite operating depending on how the meeting goes. Possible passes that evening include S0-50 around 7:55pm (0255 UTC), a low A0-92 pass at 8:42pm (0342 UTC), and another S0-50 pass at 9:35pm (0435 UTC).

If WD9EWK is on any of those passes, please feel free to give him a call and be a part of the demonstrations. The meeting site is in grid DM33. QSOs will be uploaded to Logbook of the World, and QSL cards are available on request (please e-mail WD9EWK directly with QSO details if you would like a QSL card).

[ANS thanks Patrick Stoddard, WD9EWK, for the above information]

VUCC Awards-Endorsements for February 2019

Here are the endorsements and new VUCC Satellite Awards issued by the ARRL for the period February 1, 2019 through March 1, 2019. Congratulations to all those who made the list this month! There were lots of new Not-in-my-home-grid awards this month.

CALL	01Feb	01Mar
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WC7V	1199	1200
AA5PK	1049	1055
WD9EWK	525	537
NS3L	375	400
AF5CC	351	381
AE5B	342	368
KE8FZT	275	301
W7JSD	257	279
K9UO	202	225
WB7VUF	107	206
N2NL	New	179
N1PEB	125	138
WD9EWK(DM22)	108	131
W5PFG(DM80)	New	125
WD9EWK(DM31)	New	110
W5PFG(DM95)	100	109
TI2VLM	New	106
W5PFG(DM93)	New	105
KS1G	New	102
PU4JOE	New	101
W10H	New	101

If you find errors or omissions please contact Ron off-list at <mycall>@<mycall>.com and he'll revise the announcement. This list was developed by comparing the ARRL .pdf listings for The two months. It's a visual comparison so omissions are possible. Apologies if your call was not mentioned.

Thanks to all those who are roving to grids that are rarely on

[ANS thanks Ron, W5RKN, for the above information]

For a limited time, new and renewing AMSAT members
will receive a free digital copy of
"Getting Started with Amateur Satellites"
Join or renew your AMSAT membership today at
<https://www.amsat.org/product-category/amsat-membership/>

- + AMSAT's Fox Operating Guide hamfest and demo handout sheet

- has been updated to reflect the current operational status of A0-85 and A0-95. The high and low resolution PDF files are available on their links at:
<https://www.amsat.org/station-and-operating-hints/>
- + It is possible to search AMSAT's archives (amsat-bb and ANS) by using the "site:" command in Google. For example, to find all mentions of the word "Diplexer" in amsat-bb, type this line into a browser opened to the Google front page:
Diplexer site:<http://amsat.org/pipermail/amsat-bb>
To restrict the search to a particular year, type
Diplexer site:<http://amsat.org/pipermail/amsat-bb/2014>
The AMSAT News Service (ANS) archives are searchable in a similar manner (for example hamvention in 2016):
hamvention site:<http://amsat.org/pipermail/amsat-bb/2016>
(Thanks to Dan Schultz N8FGV)
 - + On-line tweets indicate that the Philippine Diwata-2 satellite carrying an amateur radio FM transponder and APRS digipeater may be activated around March 29. The IARU has coordinated an FM downlink for voice, APRS and telemetry on 145.900 MHz and an FM voice uplink on 437.500 MHz. Additional Diwata-2 information is posted at:
<http://phl-microsat.upd.edu.ph/diwata2>
<https://www.facebook.com/PHLMicrosat>
 - + If you have lost your authorisation code for the AMSAT-UK FUNcube dashboards, there is a page on which you can request this code to be sent to your registered email address. See:
<http://data.badgersoft.com/recover-authcode> (via G4DPZ)
 - + Check out IZ5RZR's Two SatNOGS Satellite Rotators video posted at: <https://youtu.be/tcdItBsMnC0>
 - + The Internet Archive site makes all issues of 73 Magazine available: <http://tinyurl.com/ANS-074-InternetArchive-73>
Tools at <https://mikeyancey.com/73mag/index.php> offer indexed searches of the archive.
 - + The March PDF of the weather satellite publication 'GEO Newsletter' produced by the Group for Earth Observation is now available for free download. The Group for Earth Observation's aim is to enable amateur reception of weather and earth imaging satellites that are in orbit or planned for launch in the near future. Membership in GEO is free. Among the articles in this newsletter is How to "Receive X-Band Weather Satellites" by Jean-Luc Milette. Download the March 2019 GEO Newsletter from <http://www.geo-web.org.uk/geoquarterly.php>
 - + Papers for IARU-R1 Vienna meeting can be accessed at:
<https://vienna.iaru-r1.org/conference-documents/c4/>
> C4-002 bandplanning 15m satellites
<https://vienna.iaru-r1.org/conference-documents/c5/>
> C5-011 @G3VZV Satellite Coordinator's Report
> C5-011 Annex to SCR
> C5-012 2400 MHz satellite bandplanning
> C5-029 Amateur Satellites
 - + On March 14 NASA announced the projects selected in the 10th round of candidates for CubeSat space missions:
<http://tinyurl.com/ANS-076-NASA-10th-Round>
None of these satellites were found on the IARU Coordination pages at this time.

- + A free PDF of the current Raspberry Pi focused magazine, MagPi, issue 79, for March, 2019 is available now at:
<https://www.raspberrypi.org/magpi/issues/79/>
The next issue of MagPi will feature articles on Amateur Radio Projects in issue 80, available for free download starting on March 28.
- + The March 2019 Edition of SatMagazine is provided free by Satnews Publishers and is available to read online or download at:
<http://www.satmagazine.com/>
- + The March 2019 issue of CQ DATV magazine is available for download at: <https://cq-datv.mobi/69.php>
- + The 2019 Cubesat Developers Workshop will be held April 23-25, 2019 at the Cal Poly Performing Arts Center, San Luis Obispo, CA
The schedule and additional information is posted at:
<http://www.cubesat.org/workshop-information>

[ANS thanks everyone for the above information]

/EX

In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73 and remember to behave and to help keep amateur radio in space,
This week's ANS Editor,
JoAnne Maenpaa, K9JKM
k9jkm at amsat dot org